AMENDMENTS TO THE CLAIMS

Kindly amend the Claims, without prejudice, as shown below in the listing of claims. The listing of claims, shown below, will replace all prior versions, and listings, of claims in the instant Application:

Listing of Claims:

1-4 (Cancelled).

5. (Currently Amended) A multimodal polyethylene composition having;

1) a density of at least about 0.940 g/cm^3 as measured by ASTM Method D-1505;

2) a melt flow index (I_5) of from about 0.2 to about 1.5 g/10 min (as measured by ASTM D-1238, measured at 190 °C and 5 kilograms);

3) a melt flow index ratio (I_{21}/I_5) of from about 20 to about 50;

4) a molecular weight distribution, Mw/Mn, of from about 20 to about 40; and

5) a bubble stability measured on an HS50S stationary extrusion system with an BF 10-25 die, HK 300 air ring, A8 take off, and WS8 surface winder, all commercially available from Hosokawa Alpine Corporation, with a 100 mm die diameter having a 50 mm 21:1 L/D grooved feed extruder used according to the conditions described herein for a film of about 6 X 10^{-6} m thickness of at least about 1.22 m/s line speed, at least about 45 kg/hr (0.013 kg/sec) output rate, or at least about 0.5 lb/hr/rpm (0.0000011 kg/s/rps) specific output rate or a combination thereof~~.~~ ;

6) a dart impact on 12.5 micron (1.25 X 10^{-5} m) film of at least 300 g; measured according to ASTM 1709, Method A;

the composition comprising;

A) a high molecular weight fraction which;

a) is present in an amount of from about 30 to about 70 weight percent (based on the total weight of the composition);

b) has a density of at least about 0.860 g/cm^3 as measured by ASTM D-1505;

c) has a melt flow index (I_{21}) of from about 0.01 to about 50 g/10 min (as measured by ASTM D-1238, measured at 190 °C and 21.6 kilograms); and

d) a melt flow index ratio (I_{21}/I_5) of from about 6 to about 12; and

B) a low molecular weight fraction which;

a) is present in an amount of from about 30 to about 70 weight percent (based on the total weight of the composition);

b) has a density of at least about 0.900 g/cm^3 as measured by ASTM D-1505;

c) has a melt flow index (I_2) of from about 0.5 to about 3000 g/10 min (as measured by ASTM D-1238, measured at 190 °C and 2.16 kilograms);

d) a melt flow index ratio (I_{21}/I_5) of from about 5 to about 15; and

e) is prepared using a mole ratio of alpha olefin to ethylene less than that in the high molecular weight fraction of less than or equal to about 0.01:1.

6. (Original) The multimodal polyethylene composition of Claim 5 wherein;

1) the density is from about 0.945 to about 0.955 g/cm^3;

2) the melt flow index (I_5) is of from about 0.25 to about 1.0 g/10 min;

3) the melt flow index ratio (I_{21}/I_5) is of from about 24 to about 40;

4) the molecular weight distribution, Mw/Mn is from about 22 to about 38; and

5) the bubble stability is greater than about 1.32 m/s line speed or from about 0.0000017 to 0.000027 kg/s/rps specific output rate or a combination thereof;

the composition comprising;

A) a high molecular weight fraction which;

a) is present in an amount of from about 40 to about 60 weight percent (based on the total weight of the composition);

b) has a density of from about 0.890 to about 0.940 g/cm^3;

c) has a melt flow index (I_{21}) of from about 0.2 to about 12 g/10 min; and

d) a melt flow index ratio (I_{21}/I_5) of from about 7 to about 12; and

B) a low molecular weight fraction which;

a) is present in an amount of from about 40 to about 60 weight percent (based on the total weight of the composition);

b) has a density of from about 0.910 to about 0.975 g/cm^3;

c) has a melt flow index (I_2) of from about 1.0 to about 1,000 g/10 min;

d) a melt flow index ratio (I_{21}/I_5) of from about 6 to about 12; and

e) the ratio of alpha olefin to ethylene is less than that in the high molecular weight fraction and less than or equal to about 0.01:1.

7. (Original) The multimodal polyethylene composition of Claim 6 wherein;

1) the molecular weight measured by Gel Permeation Chromatography is from about 90,000 to about 420,000.

2) the bubble stability is reflected in an output rate of from about 0.013 to 0.13 kg/s;

the composition comprising;

A) a high molecular weight fraction which;

a) has a melt flow index (I_{21}) of from about 0.2 to about 0.4 g/10 min; and

b) a molecular weight of from about 135,000 to about 445,000;

c) is prepared using a mole ratio of alpha olefin to ethylene of from about 0.02:1 to about 0.35:1 and

B) a low molecular weight fraction which;

a) has a density of from about 0.970 to about 0.975 g/cm^3;

b) has a molecular weight of from about 15,800 to about 35,000; and

c) is prepared using a mole ratio of alpha olefin to ethylene of less than or equal to about 0.007:1.

8. (Original) The multimodal polyethylene composition of any of Claims 5 through 7 wherein the composition is tailored sufficiently to produce an increase of melt flow ratio (I_{21}/I_5) of from about 1 to about 4 units as compared with the same composition without tailoring.

9. (Original) The multimodal polyethylene composition of any of Claims 5 through 7 which;

i) when fabricated into a film of 0.5 mils (1.27×10^{-5} m) thickness, has a dart impact of greater than about 400 g;

ii) when fabricated into a film of 1.0 mils (2.54×10^{-5} m) thickness, has a film appearance rating of greater than or equal to 20; and

iii) when fabricated into a blown film has (a) a bubble stability of at least about 240 ft/min (1.22 m/s) line speed, (b) can be used to produce blown film of 6 micron (6×10^{-6} m) thickness at actual output rates of from about 50 to about 1100 lb/hr (0.0063 to 0.14 kg/s) or (c) specific output rates of from about 0.5 to about 15 lb/hr/rpm (1.05×10^{-6} to 3.15×10^{-5} kg/s/rps), or a combination of at least 2 of (a) (b) and (c).

10. (Currently Amended) The multimodal polyethylene composition of Claim 5 produced by a process comprising:

1) contacting in a first gas phase fluidized bed reactor under polymerization conditions and at a temperature of from about 70 °C to about 110 °C, a supported titanium magnesium catalyst precursor, cocatalyst, and a gaseous composition, the gaseous composition having;

i) a mole ratio of alpha-olefin to ethylene of from about 0.01:1 to about 0.8:1; and optionally

ii) a mole ratio of hydrogen (if present) to ethylene of from about 0.001:1 to about 0.3:1,

to produce a high molecular weight polymer(HMW); and

2) transferring the HMW polymer from step 1 to a second gas phase fluidized bed reactor under polymerization conditions and at a temperature of from about 70 °C to about 110 °C, with a gaseous composition having;

i) a mole ratio of alpha-olefin to ethylene of from about 0:0005:1 to about 0.01:1; and

ii) a mole ratio of hydrogen (if present) to ethylene of from about 0.01:1 to about 3:1

to form a polymer blend product; and

3) melting the polymer blend product in an extruder having a mixer vent wherein;

i~~i~~) the ~~mixture~~ <u>mixer</u> vent has an oxygen concentration of from about 0.05 to about 6 volume percent oxygen in nitrogen; and

ii) the extrusion temperature is sufficient to melt the polymer and result in tailoring in the presence of the oxygen; and

4) passing the molten polymer blend through one or more active screens, wherein in the case of two or more active screens, the screens are positioned in series, each active screen having a micron retention size of from about 2 to about 70, at a mass flux of about 5 to about 100 $lb/hr/in^2$ (1.0 to 20 $kg/s/m^2$) to form a screened molten polymer blend.

11. (Original) The multimodal polyethylene composition of Claim 10 wherein in the process;

1) the gaseous composition in step 1) has;

i) a mole ratio of alpha-olefin to ethylene of from about 0.02:1 to about 0.35:1; and

ii) a mole ratio of hydrogen (if present) to ethylene of from about 0.01:1 to about 0.2:1, and

2) the gaseous composition in step 2) has;

i) a mole ratio of alpha-olefin to ethylene of from about 0.001:1 to about 0.007:1; and optionally

ii) a mole ratio of hydrogen (if present) to ethylene of from about 0.5:1 to a bout 2.2:1; and

wherein

3) the ratio of the weight of polymer prepared in the first gas phase reactor used in step 1) to the weight of polymer prepared in the second gas phase reactor used in step 2) is in the range of about 30:70 to about 70:30.

12. (Original) The multimodal polyethylene composition of Claim 10 or 11 which, when fabricated into a film using a HS50S stationary extrusion system with an BF 10-25 die, HK 300 air ring, A8 take off, and WS8 surface winder, all commercially available from Hosokawa Alpine Corporation, with a 100 mm die diameter having a 50 mm 21:1 L/D grooved feed extruder has a vertical bubble stability described by:

Alpine film line vertical bubble stability (in ft/min) = 275.05 - 0.000081* Mz + 0.0000735* Mz+1 (BB) + 0.0001312*viscosity (P) @ 0.1 sec^{-1} shear rate + 1.0033E-9*(viscosity (P) @ 0.1 sec^{-1} shear rate)^2 - 0.026764*viscosity (P) @ 100 sec^{-1} shear rate [where (BB) is backbone, E is exponent of base 10] or

Alpine film line vertical bubble stability (in m/s) = {0.005 }{275.05 - 0.000081* Mz + 0.0000735* Mz+1 (BB) + (0.0001312*0.1*viscosity (Pa•s) @ 0.1 sec^{-1} shear rate) + 1.0033E-9*[(0.1) (viscosity (Pa•s) @ 0.1 sec^{-1} shear rate)]^2 - (0.026764*0.1*viscosity (Pa•s) @ 100 sec^{-1} shear rate)}

13. (Original) The multimodal polyethylene composition of Claim 10 or 11 wherein when made into a film has a Dart Drop calculatable using the equation: Dart drop (g) = 469.9 - 54.8*(G'/G"@ 0.01 shear rate) -91.4 (G'/G"@ 0.01 shear rate)^2.

14-18 (Cancelled).

19. (Cancelled).

20. (Currently Amended) ~~A~~ The multimodal polyethylene composition of Claim 5, wherein said multimodal composition has ~~having~~ a NCLS of at least 2400 hours, a ratio of flexural modulus to density of at least 1140 kPa * m^3/kg, and an I_{21}/I_2 ~~I^{21}/I^2~~ of at least 90.

21. (Currently Amended) ~~A~~ The multimodal polyethylene composition of Claim 5, wherein said multimodal composition has ~~having~~ a NCLS of at least 2400 hours, and a ratio of flexural modulus to density of at least 1140 kPa * m^3/kg produced by a process comprising:

1) contacting in a first gas phase fluidized bed reactor under polymerization conditions and at a temperature of from about 70°C to about 110°C, a supported titanium magnesium catalyst precursor, cocatalyst, and a gaseous composition, the gaseous composition having;

i) a mole ratio of alpha-olefin to ethylene of from about 0.01:1 to about 0.8:1; and optionally

ii) a mole ratio of hydrogen (if present) to ethylene of from about 0.001:1 to about 0.3:1,

to produce a high molecular weight polymer (HMW); and

2) transferring the HMW polymer from step 1 to a second gas phase fluidized bed reactor under polymerization conditions and at a temperature of from about 70°C to about 110°C, with a gaseous composition having;

i) a mole ratio of alpha-olefin to ethylene of from about 0:0005:1 to about 0.01:1; and

ii) a mole ration of hydrogen (if present) to ethylene of from about 0.01:1 to about 3:1

to form a polymer blend product; and

3) melting the polymer blend product in an extruder having a mixer vent wherein;

i) the ~~mixture~~ <u>mixer</u> vent has an oxygen concentration of from about 0.05 to about 6 volume percent oxygen in nitrogen; and

ii) the extrusion temperature is sufficient to melt the polymer and result in tailoring in the presence of the oxygen; and

4) passing the molten polymer blend through one or more active screens, wherein in the case of two or more active screens, the screens are positioned in series, each active screen having a micron retention size of from about 2 to about 70, at a mass flux of about 5 to about 100 $lb/hr/in^2$ (1.0 to 20 $kg/s/m^2$) to form a screened molten polymer blend.

22-25. (Cancelled).